CLAIMS:

1. A method, comprising:
identifying an infarct region within the ventricle of a subject; and
delivering at least one structurally reinforcing component to the infarct region, wherein the structurally reinforcing component comprises cells.

2. The method of claim 1, wherein the cells comprise a genetically engineered cell in which at least one gene encoding a polypeptide comprising an antigenic determinant which is recognized by a desired recipient subject or at least one gene which encodes a protein associated with the synthesis of a molecule comprising an antigenic determinant recognized by the desired recipient subject has been disrupted.

3. The method of claim 1, wherein both chromosomal copies of the at least one gene have been disrupted

4. The method of claim 1, wherein the cells comprise α-1,3-galactosyltransferase (GGTA1) knock-out swine cells.

5. The method of claim 1, wherein delivering at least one structurally reinforcing agent increases the modulus of elasticity of the infarct region.

6. The method of claim 1, wherein the cells replace damaged cells in and around the infarct region.

7. The method of claim 1, wherein delivery of the at least one structurally reinforcing agent occurs within 2 weeks of a myocardial infarction (MI).

8. The method of claim 1, further comprising at least one nucleic acid encoding a detectable polypeptide carried by the cells, the at least one nucleic acid being operably linked to a promoter.

9. A method, comprising:
identifying an infarct region within the ventricle of the heart of a subject; and
applying electrical stimulation to the heart; and
delivering at least one structurally reinforcing component to the infarct region.

10. The method of claim 9, wherein at least one structurally reinforcing component comprises cells.

11. The method of claim 10, wherein the cells comprise a genetically engineered cell in which at least one gene encoding a polypeptide comprising an antigenic determinant which is recognized by a desired recipient subject or at least one gene which encodes a protein associated with the synthesis of a molecule comprising an antigenic determinant recognized by the desired recipient subject has been disrupted.

12. The method of claim 10, wherein the cells comprise α-1,3-galactosyltransferase (GGTA1) knock-out swine cells.

13. The method of claim 10, wherein applying electrical stimulation to the heart comprises using an agent for stimulation.

14. The method of claim 9, wherein applying electrical stimulation to the heart comprises using a device for stimulation.

15. The method of claim 14, wherein the device comprises a pulse generator (PG).

16. The method of claim 14, wherein the device comprises leads.

17. The method of claim 9, wherein applying electrical stimulation to the heart before normal conduction (short AV delay) facilitates regional unloading of the infarct region.

18. The method of claim 17, wherein unloading of the infarct region enhances the local microenvironment through reduction of work.

19. A method, comprising:
identifying an infarct region within the ventricle of a subject;
applying a pacing algorithm for CRT (cardiac resynchronization therapy) treatment, or normal pacing; and
delivering at least one structurally reinforcing component to the infarct region.

20. The method of claim 19, wherein the at least one structurally reinforcing component comprises cells.

21. The method of claim 20, wherein the cells comprise a genetically engineered cell in which at least one gene encoding a polypeptide comprising an antigenic determinant which is recognized by a desired recipient subject or at least one gene which encodes a protein associated with the synthesis of a molecule comprising an antigenic determinant recognized by the desired recipient subject has been disrupted.

22. The method of claim 21, wherein the cells comprise α-1,3-galactosyltransferase (GGTA1) knock-out swine cells.

23. A method comprising:
identifying an infarct region within the ventricle of a subject;
applying electrical stimulation to the infarct region of the ventricle for peri-infarct induction, and
delivering at least one structurally reinforcing component to the infarct region.

24. The method of claim 23, wherein the structurally reinforcing component comprises a genetically engineered cell in which at least one gene encoding a polypeptide comprising an antigenic determinant which is recognized by a desired recipient subject or at least one gene which encodes a protein associated with the synthesis of a molecule comprising an antigenic determinant recognized by the desired recipient subject has been disrupted.

25. The method of claim 23, wherein applying electrical stimulation to the infarct region of the ventricle induces cell proliferation in the extracellular matrix (ECM).

26. A kit comprising:
a delivery lumen;
at least one component, delivered from the delivery lumen,
the at least one component comprising cells;
wherein said cells comprise a genetically engineered cell in which at least one gene encoding a polypeptide comprising an antigenic determinant which is recognized by a desired recipient subject or at least one gene which encodes a protein associated with the synthesis of a molecule comprising an antigenic determinant recognized by the desired recipient subject has been disrupted..

27. The kit of claim 26, wherein said cells comprise α-1, 3-galactosyltransferase (GGTA1) knock-out cells.

28. The kit of claim 26, further comprising cells delivered to an infarct region of said ventricle

29. The kit of claim 26, further comprising a delivery device.

30. The kit of claim 26, further comprising one or more agents.

31. The kit of claim 30, wherein one or more agents comprise a growth factor.

32. The kit of claim 26, wherein the kit includes an electrical stimulation device.

33. A method comprising:
detecting the presence or survival of a swine α-1,3-galactosyltransferase (GGTA1) knock-out cellular transplant in the heart of a subject by detecting at least one nucleic acid encoding a detectable polypeptide carried by the cells, and the at least one nucleic acid being operably linked to a promoter;
wherein the presence of the detectable polypeptide in the sample demonstrates presence or survival of the cellular transplant.

34. The method of claim 33, wherein the detectible polypeptide comprises a polypeptide detectible by fluorescence.

35. A method comprising:
identifying an infarct region within the ventricle of the heart of a subject; and
applying electrical stimulation to the heart; and
delivering a structurally reinforcing agent to a ventricle;
wherein the structurally reinforcing agent comprises one or more solid material capable of increasing the compliance of the ventricle, or introducing a solid material that strengthens the infarct region and prevents its expansion.

36. The method of claim 35, wherein the solid material comprises at least one material selected from the group consisting of an organic polymer, a silicone based polymer, a biodegradable polymer, a non-biodegradable polymer, a metal, and an engineered biomaterial.

37. The method of claim 36, wherein the solid polymer comprises an engineered biomaterial.

38. The method of claim 37, wherein the engineered biomaterial comprises at least one extracellular material consisting of Small Intestine Sub-mucosa (SIS), urinary bladder matrix (UBM) and extracelluar matrix derived from other tissues

39. A method, comprising:
identifying an infarct region within a ventricle of a heart of a subject;
applying electrical stimulation to the heart; and
delivering bioerodible particles to the ventricle;
wherein the particles carry at least one growth promoting agent.

40. The method of claim 39, wherein the growth promoting agent is at least one agent consisting of basic fibroblast growth factor (bFGF), -α), platelet-derived growth factor-BB (PDGF-BB), platelet-derived growth factor-AB (PDGF-AB), transforming growth factor-alpha (TGF-α), TGF-β1,2, or 3, granulocyte colony-stimulating factor (G-CSF), stem cell growth factor (SCF), SDF-1, HGF, IGF; or factors known to induce vascularization, vascular endothelial growth factor (VEGF), tumor necrosis factor- alpha (TNF-α), , angiogenin, angiopoietin-1, Del-1, follistatin, pleiotrophin (PTN), proliferin, transforming, and vascular permeability factor (VPF).

41. A method comprising:
identifying an infarct region within the ventricle of the heart of a subject;
applying electrical stimulation to the heart; and
delivering a scaffolding material to the ventricle.

42. The method of claim 41, further comprising scaffolding delivered to the infarct region of the ventricle.

43. The method of claim 42, wherein the scaffolding carries at least one growth factor.

44. The method of claim 43, wherein the growth factor comprises at least one of the following consisting of basic fibroblast growth factor (bFGF), leukemia inhibitory factor (LIF), vascular endothelial growth factor (VEGF), tumor necrosis factor-alpha (TNF-α), platelet-derived growth factor-BB (PDGF-BB), -α), platelet-derived growth factor-BB (PDGF-BB), platelet-derived growth factor-AB (PDGF-AB), transforming growth factor-alpha (TGF-α), TGF-β1,2, or 3, granulocyte colony-stimulating factor (G-CSF), stem cell growth factor (SCF), SDF-1, HGF, IGF; or factors known to induce vascularization, angiogenin, angiopoietin-1, Del-1, follistatin, granulocyte colony-stimulating factor (G-CSF), pleiotrophin (PTN), proliferin, transforming growth factor-alpha (TGF-α), Hypoxia inducible factor (HIF) and vascular permeability factor (VPF).

45. A. composition comprising:
identifying an infarct region within the ventricle of the heart of a subject;
applying electrical stimulation to the heart; and
applying a bioerodible microparticle.

46. The composition of claim 45, wherein the bioerodible microparticle comprises a biocompatible functional acrylate; and a reduced thiol-containing compound capable of forming a bioerodible matrix in a ventricle of a subject.

47. The composition of claim 46, wherein the bioerodible microparticles comprises PLGA 50:50.

48. The composition of claim 46, wherein the biocompatible functional acrylate comprises di-acryloyl polyethylene glycol.

49. The composition of claim 46, wherein the reduced thiol-containing compound comprises poly-s-benzyl-L-cysteine.

50. The composition of claim 45, further comprising forming a bioerodible matrix in an infarct region of the ventricle of a subject.

51. A method comprising:
identifying an infarct region within the ventricle of the heart of a subject;
applying electrical stimulation to the heart;
delivering a first component comprising a biocompatible polymer-forming agent(s); and
delivering a second component comprising a biocompatible perfluorinated moiety; and
wherein collectively the first component and the second component are capable of forming a matrix product in a ventricle.

52. The method of claim 51, wherein forming a matrix product in a ventricle comprises forming a matrix product in an infarct region of said ventricle.

53. A method, comprising:
identifying an infarct region within the ventricle of the heart of a subject;
applying electrical stimulation to the heart; and
delivering at least one structurally reinforcing agent to the infarct border zone region.

54. The method of claim 53, wherein delivering at least one structurally reinforcing agent to the infarct border zone regions is combined with delivering at least one structurally reinforcing agent to the infarct region.

55. A method to minimize post-infarct ventricular remodeling, comprising: delivering electrical stimulation using one or more sensing channels for sensing intrinsic cardiac activity; a plurality of pacing channels for delivering pacing pulses; a controller for controlling the delivery of pacing pulses in accordance with a pacing algorithm; a patch having a plurality of pacing electrodes incorporated into the pacing channels, and
delivering at least one structurally reinforcing component to the infarct region.

56. The method of claim 55, further comprising a drug delivery system for delivering an agent selected from a group consisting of an ACE inhibitor, a beta blocker, a growth factor, and an anti-apoptotic factor.

57. The method of claim 55, further comprising an impedance sensor for detecting changes in wall motion and wall thickness in an area in proximity to the infarct and wherein the controller is programmed to modify the delivery of pacing pulses.

58. The method of claim 55, wherein delivering at least one structurally reinforcing agent increases the modulus of elasticity of the infarct region.

59. The method of claim 55, wherein delivering at least one structurally reinforcing agent to the infarct region comprises delivering microspheres.

60. The method of claim 55, wherein the structurally reinforcing agent comprises a modified and/or unmodified algenate gel material.

61. A kit for the treatment of cardiac ischemia, the kit comprising:
a delivery lumen;
a structural reinforcement material which is to be delivered through the delivery lumen;
a cardiac electrical device which includes conductive leads which are designed to be placed near the structural reinforcement material after the structural reinforcement material has been implanted into cardiac tissue.

62. The kit of claim 61, wherein the structural reinforcement material comprises micronized porcine UBM (urinary bladder matrix).